

NOTE ON SOME TRILOBITES NEW TO AUSTRALIA.

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LICHAS PALMATA variety SINUATA, *emend.* from L. SINUATA.

Lichas sinuata, Ratte, Proc. Linn. Soc. N. S. W., 1886, Vol. I, (2 ser.), p. 1065.

(Plate I, fig. 6.)

At the meeting of November last, I announced the discovery of silicified pygidia of *Lichas* in the Upper Silurian Limestone of Wellington. During the printing of the paper it was suggested to me to name some of the fossils I had figured, as it was thought better to do so even at the risk of creating a synonym, than to leave them unnamed. I, therefore, decided to do so, *provisionally*, at least, for some of the fossils sufficiently represented, and in a footnote, (page 1065) I proposed the name of *Lichas sinuata*, in consequence of deep sinuses situated at the posterior angles of the four lateral ribs of the pygidium. I also remarked that our specimens strongly resemble *Lichas hirsutus*, Fletcher, and *Lichas palmata*, Barrande, both belonging to Upper Silurian Rocks. I indeed do not find much difference between these two species, at least from the descriptions given (1). In both, the margin of the pygidium is raised sufficiently to form a prominent pad which joins with the two extreme spines and with the four lateral ones which are produced beyond of the margin. This character, however, is very slightly, if at all, indicated in our fossil. If any of the figures at hand, in the absence of any other works,

(1) In fact Barrande says, p. 602 :—“ La forme figurée par notre ami, M. Fletcher, de Dudley, sous le nom de *Lichas hirsutus*, nous paraît “identique avec celle que nous décrivons.”

leave any doubt as to the distinction to be drawn, it is the pygidium of *Lichas palmata* represented in fig. 9, pl. 28 in Barrande. For this reason it would perhaps be wiser to consider the Wellington fossil only as a variety.

In order to show the differences and affinities above alluded to, I give sketches of the outlines of the species concerned. It will be seen that the sinuses, which are very exaggerated in our variety, are very distinct, if not so deep, in Barrande's above-mentioned figure.

ACIDASPIS sp. near *A. DORMITZERI*, Cord.

Barrande, Syst. Sil. 1852, p. 728, Pl. 38, fig. 22.

(Plate II, figs. 1 and 1 bis.)

The specimen here recorded is very nearly complete, and is remarkable for its minuteness, being exactly 5 mm. in length, not including the spines of the pygidium.

It was found at Bowning by Mr. J. Mitchell, together with a great number of other trilobites, &c.

Although nearly complete, and on that account deserving to be figured, still this specimen leaves doubt as to the ornaments of its frontal margin, as well as of some slight details in the pygidium, and in consequence of its minuteness it leaves also doubts about some other parts. As the figures of other species related to it can be seen in Barrande's work I will only quote them here without commenting at any length. They all have nine segments in the body.

Acidaspis Leonhardi, Barr. p. 720, pl. 37, fig. 1, length 26 mm.

Acidaspis Hoernesii, Barr. p. 723, pl. 38, fig. 30, length 20 mm.

Acidaspis Geinitziana, Cord. p. 725, pl. 39, fig. 45-49, length about 14 mm.

Acidaspis Roemeri, Barr. p. 726, pl. 39, fig. 29, length 13 mm.

Acidaspis minuta, Barr. p. 729, pl. 37, fig. 18, length 15 mm.

Acidaspis ruderalis, Cord. p. 733, pl. 37, fig. 32, length 30 mm.

With all of these, including *A. Dormitzeri*, our specimen exhibits some characters in common. Thus it resembles *A. minuta* in regard to the pygidium and in some degree the rounded outline of the head; while this species (*A. minuta*), differs from all others mentioned by having three tubercles instead of one, on the pleural ridges, not including one at the origin of the pleural spines.

The pygidium does not seem to agree perfectly with that of any of those mentioned; besides it is smaller, being at the utmost one eighth of the length, not including the spines; while in *A. Dormitzeri* and *A. minuta* it is one seventh of the length, and in the other more than that proportion. (1)

The drawings being sufficiently enlarged to show all the visible characters, I shall abstain from a lengthy description, and insist only on the principal features.

The length of the head is less than one third of the whole length not including the spines. The median part of the glabella is narrow, its width being a little less than one-fifth of the width of the head. The distance between the false grooves which limit that median part and the eye is a little more than the width of the median part of the glabella, leaving ample room for the internal triangle of the fixed cheek. This triangle includes on the specimen four or five tubercles which are visible on both sides of the lateral nodules of the glabella (those nodules, two on each side, are bounded by the median, the posterior and the occipital furrows). In *A. Leonhardi*, *A. Hoernesii*, *A. Geinitziana*, the above-mentioned triangle is considerably reduced, and in *L. Roemeri* is completely absent or replaced by a groove instead of an elongated nodule.

(1) In fig. 22, pl. 38 of Barrande, the pygidium is certainly more than one seventh, say one sixth of the length, but I quote Barrande's text p. 728, "La tête occupe un peu moins du tiers, et le pygidium un septième de la longueur totale." As the author says *totale*, it is possible that in this case he included the spinal ornaments, although I doubt it.

The eyes in our specimen are prominent and much brought forwards compared with those in other allied species. What is missing is the frontal margin, including the two triangular grooves, by which it is connected with the ocular ridges and the facial suture. This frontal margin, in some, is adorned with series of tubercles (*A. minuta*, *A. Leonhardi*, *A. Roemeri*), while in others it is smooth (*A. Hoernesii*). Barrande says that the head of *A. Dormitzeri* is similar to that of *A. Leonhardi*, but his (figure 22, pl. 38), of the former does not show tuberculations at the frontal margin.

Further, the head of our fossil exhibits a more rounded outline than any of the other species considered. I will explain it simply. Let us draw a straight line parallel to the axis of the body and passing by the origin of one of the genal spines. In *Acidaspis Dufrenoyi*, Barr., (Pl. 38, fig. 25), this line will form an angle with the external border of the movable cheek, which is nearly straight giving to the head the shape of a triangle. In some of the species mentioned such as *A. Hoernesii*, *A. Dormitzeri*, the angle will be smaller; in *A. Roemeri* still smaller; in *A. minuta* this angle will be reduced to nothing, as the line will be tangential to the head-border; and lastly in our fossil, and still more so in *A. Verneuli*, Barr., (Pl. 38, fig. 5), the border will be cut by the parallel line. That border is adorned by a regular line of tubercles, each of which gives rise to a very fine spine, the impression of which has been left on the stone. The genal spines are bent nearly in a direction parallel to the outline of the body.

The body has nine rings; each pleura is terminated by a spine progressively incurved from the first to the last, which is nearly parallel to the axis.

The pygidium is rather difficult to understand in so small a specimen; it is much adorned with tubercles and shows distinctly eight spines, but whether the principals are the second or the third in order, it is not easy to decide.

In *resumé* there are two strong characters in our fossil in favour of making it a different species from those represented in Barrande,

or with such figures as I could compare it; 1st, the external outline of the movable cheeks, and 2nd, the proportion that the length of the pygidium bears to the length of the body, which proportion is smaller than in any of the species brought into comparison with it. It therefore remains to be named, or to be identified with some species unknown to me.

All the species mentioned above are placed by Barrande in his "Etage E, Faune III," except *A. Hoernesii*, which belongs to his "Etage, F, Faune, IV," and is found also in the next "Etage."

On the same piece of rock with this minute *Acidaspis* is a hollow impression of *Staurocephalus* with which I shall deal hereafter.

ACIDASPIS near *A. LEONHARDI*, Barr.

Barrande, Syst. Sil. 1852, p. 720, Pl. 37, fig. 1.

(Plate II., figs. 2-4.)

The remains of *Acidaspis* in the Bowring beds are rare indeed, compared with those of *Encrinurus*, *Phacops*, *Sphaerexochus*, *Calymene*, and *Bronteus*. (1) For the above reason, I will exhaust the materials I have in hand and represent three more specimens, two from Mr. Mitchell, and another given by him to the Museum.

They all include the median part of the head only, and cannot be properly identified, although the resemblance of one (fig. 4) to *A. Leonhardi* is rather strong. The chief difference is that in one of them especially (fig. 3), the internal triangle of the fixed cheek of

(1) The earliest mention that I know of the genus in Australia is by Chas. Jenkins, Esq., of Yass, in Proc. Linn. Soc. Vol. III. pl. 17, where he represents *A. Brightii* from the lower part of the Hume beds. I find *A. Brightii*, Murch. from the Wenloch limestone, Dudley, figured in Murchison's Siluria, pl. 18. However, from these data only it seems hardly possible to ascertain this identification beyond doubt. (See also Barr. Sil. Syst. p. 752, and in Phil. and Salter, Mem. Geol. Surv. Brit. 1848, Vol. 2, part I. pl. IX). The pygidium of *A. Brightii* as represented by Mr. Jenkins, somewhat resembles that represented by me in Proc. Linn. Soc. Vol. I. 2 ser. pl. 15, fig. 12. (Subsequently I have been given to understand that this gentleman did not intend to insist on the identification.)

which I have already spoken, is broader than in *A. Leonhardi*. It would therefore come nearer to *A. Dormitzeri* on that account, but, as I have already said (p. 98), although Barrande does not describe the head of the last species on the ground of its similarity to that of the former, still he does not represent the frontal margin of *A. Dormitzeri* with the granulation which exists in *A. Leonhardi*. These three specimens might belong to two or even three different species.

One of the specimens being very well preserved, as regards the granulation of the glabella, I have represented it increased four times, viz., twice as much as the others, in order to show more exactly all the details.

STAUROCEPHALUS near *S. MURCHISONI*, Barr.

Barrande, Sil. Syst. p. 812, pl. 43 ; Salter, Brit. Trilob. p. 84, pl. 7.

(Plate II., figs. 5-9.)

This genus was recorded from Australia, for the first time, by Prof. de Koninck, (in his Fossiles Paléozoïques Nouv.-Galles du Sud, 1876, p. 47, pl. 1, fig. 8), when he dedicated to the late Rev. W. B. Clarke, a beautiful species from Rock Flat Creek (Monaro), whence the doubtful *Lichas palmata* which is spoken of by de Koninck, also comes.

The specimens of *Staurocephalus* I am about to record and represent here are from Bowning, and have already been referred to in the Proceedings by M. Mitchell under the name of *S. Murchisoni* ; but he acknowledges himself that they do not perfectly agree with the representations of this fossil by Salter and Barrande.

Out of the five specimens, three show only the head, not unlike that of *S. Murchisoni* ; another specimen is a hollow cast of the head and pleuræ (fig. 5) ; and the last, which is nearly complete, has been recently handed to me by Mr. Mitchell (fig. 6).

I do not see any remarkable difference between the heads represented in our figures, and fig. 28 of Barrande's plate 43, except that

the furrows of the glabella are not apparent in our specimens, and that the median part of the head seems also more slender, becoming narrower as it reaches the globular projection.

The great difference is in the pygidium, which, although composed of the same number of pleuræ, is broader and has a nearly flat surface, and only shows the origin of appendages on the outer margin, where unfortunately the prolongations of these appendages are broken (fig. 6). The dimensions of the last specimen are as follows :—

Length 17 mm.

Breadth 10 mm.

Length of head $6\frac{1}{2}$ mm.

Length of pygidium $1\frac{1}{2}$ mm.

Width of pygidium 3 mm.

One specimen, (fig. 7) which was lent to me from the Department of Mines for comparison, shows only the head, which is 10 mm. in length, corresponding to about 26 mm. for the total length of the animal without the appendages of the pygidium, and 15 to 16 mm. in breadth.

EXPLANATION OF PLATES.

(Plate I).

DIAGRAMS OF PYGIDIA. FIGS. 1-6.

Fig. 1.—*Lichas hirsutus*, Fletcher (= *L. palmata*, Barr.) Journ. Geol. Soc. 1850, pl. XXVII., bis, fig. 2. × 2.

Fig. 2.—Id. id. Loc. cit., pl. XXVII., fig. 6. × 2.

Fig. 3.—Id. id. Loc. cit., pl. XXVII., fig. 5. × 2.

Fig. 4.—*Lichas palmata*, Barr. Système Silur. Bohem., pl. 28, fig. 1.

Fig. 5.—Id. Loc. cit., fig. 9. This fig. is accompanied in Barrande's work by the following remark :—"Pygidium isolé, dont l'axe est très-prolongé, et dont les tubercules spiniformes sont très-développés sur le contour." × 2.

Fig. 6.—*Lichas palmata* var. *sinuata*. × 3.

(Plate II),

Fig. 1.—*Acidaspis* near *A. Dormitzeri*, Corda. From Bowning (J. Mitchell, Esq.) $\times 10$.

Fig. 1. bis.—The same of natural size.

Figs. 2 and 3.—Heads of *Acidaspis*. $\times 2$.

Fig. 4.—Head of *Acidaspis* near *A. Leonhardi*. $\times 4$.

Fig. 5.—*Staurocephalus* near *S. Murchisoni*, Barr. Hollow impression. $\times 2$.

Fig. 6.—*Staurocephalus* near *S. Murchisoni*, Barr. Complete specimen. $\times 2$.

Fig. 7.—Head of same. (Coll. Geol. Surv. N. S. W., from Bowning.) $\times 2$.

Fig. 8.—Head of same. $\times 2$.

Fig. 9.—Head of same showing denticulated border. $\times 2$.

N.B.—Unless otherwise stated, the specimens of *Acidaspis* and *Staurocephalus* have been kindly lent by M. J. Mitchell, and are from Bowning.